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Stockpile Report to the Congress

April – September 1980

federal emergency management agency

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FEDERAL EMERGENCY MANAGEMENT AGENCY
Washington, D.C. 20472

January 19, 1981

Honorable Walter F. Mondale
President of the Senate

Honorable Thomas P. O'Neill, Jr.
Speaker of the House of Representatives

Sirs:

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be stockpiled in the interest of national defense to preclude a costly and dangerous dependence upon foreign sources of supply in times of national emergency.

The President assigned stockpiling activities to the Director of the Federal Emergency Management Agency. The Office of Plans and Preparedness in the Agency is established to carry out the mandate of the Stock Piling Act. This Stockpile Report to the Congress for April–September 1980, together with a statistical supplement under separate cover, is submitted in accordance with Section 11 of the Act.

Sincerely yours,

John W. Macy, Jr.
Director

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HIGHLIGHTS

- New stockpile goals were announced May 2, 1980, for 61 family groups and individual stockpile materials.

  Presidential guidance remained unchanged.

  A new material was added—abrasive grade bauxite.

  A material was eliminated as no longer strategic—shellac.

  A new method of calculating upgraded forms was used.

  Goals were rounded to emphasize that they are targets.

- Tin and industrial diamond stones were offered for sale.

NATIONAL DEFENSE STOCKPILE INVENTORY

September 30, 1980

	Acquisition Cost (Billions of $)	Market Value[1] (Billions of $)
Reserved for Goals	$2.4	$8.1
Excess above Goals	1.1	6.8
Total	$3.5	$14.9

[1]Market values are prices at which comparable materials are being traded, or in the absence of trading, values are estimates. They do not necessarily reflect the amount that would be realized at time of sale.

1980 STOCKPILE GOALS

Revised goals for stockpile materials were announced on May 2, 1980. A macroeconomic model is used to project the Gross National Product for a wartime situation. Assumptions about austerity, mobilization characteristics, and Government policies are built into the model variables. Estimates are then made of the raw materials needed to support such a wartime output and of the supplies available. Stockpile goals are the difference between the requirements for materials and the amount likely to be available in wartime. These stockpile goals measure our Nation's vulnerability to supply disruption for strategic and critical materials.

While domestic sources do exist for most strategic materials, imports are an increasing percentage of consumption for many of them. Not only are we import dependent, but this dependence has increased in recent years, and that trend is expected to continue. In some cases—cobalt, chromite, platinum—the material exists in this country, but can be produced overseas less expensively so that domestic sources have not been developed. However, in other cases a potential domestic supply source does not or is not known to exist. Goals for these materials have remained sizeable or increased.

As a part of calculation of the 1980 goals, historical consumption data were revised, and substitution factors were altered to conform with changes in technological trends. Updated and refined information on the availability of foreign and domestic supplies, production capacities, political reliability factors, and defense expenditures was added to reflect changes in international supply conditions and technology advances.

Shellac has been deleted as no longer strategic and critical, and a new material has been added—abrasive grade bauxite.

To improve the accuracy of the goal estimates, each material family group goal was considered both as a group and as individual components. A wide range of forms of these materials is used by different industries. The raw ore is usually the most versatile form. Higher upgraded or processed forms of a material may have only a few uses. A technology change or change in type of military hardware being used could greatly alter the goal for a processed form of a material. On the other hand, if there is limited plant capacity for processing the ore into a higher form for these various uses, then all of the stockpile goal can not be held in the raw ore form. Another limiting factor for some forms of materials is that storage problems may occur when the material is stored for long periods of time.

To account for these problems, a desired inventory mix has been determined by converting the group goal into individual material goals within the family. For example, an aluminum metal group goal of 7,150,000 short tons of aluminum metal has been established. The processing capacity of the domestic aluminum industry was examined, and a goal for bauxite established such that this quantity of ore could be processed. Because of technical and economic problems, alumina is not a suitable form for the long term storage necessary for stockpiled materials. Thus, a zero goal for alumina was set. The quantity required in excess of estimated supply that could not be processed with existing plant capacity should then be held in the form of aluminum. The conversion factors used to reduce all forms of the aluminum metal group to a common denominator are those listed in appendix 2.

This recognition of capacity limitations for processing materials at each stage of the production process results in an accurate picture of our potential materials needs. As new domestic processing capacity is added or older facilities phased out, these inventory mixes within a family group will be adjusted.

CONTINUING ACTIVITIES

The Strategic and Critical Materials Stock Piling Act provides that a stock of strategic and critical materials be held to decrease dependence upon foreign sources of supply in times of emergency. The provisions of the Act and the Presidential planning guidance are the authorities for administering the program. Executive Order 12155 vests the primary responsibility for planning the stockpile program in the Director of the Federal Emergency Management Agency (FEMA). Within FEMA the Office of Plans and Preparedness has been assigned stockpile activities.

The Stock Piling Act requires that the stockpile inventory be sufficient to cover U.S. needs for not less than three years of a national emergency. The President's stockpile policy guidance gives priority to meeting requirements for the first planning year, and includes additional assumptions about the wartime economy. These guidelines are followed in determining the stockpile goals which are the difference between estimated supply and estimated requirements for each strategic material. Periodic review and updating of the goals is required by the President's policy to ensure a current estimate of our Nation's vulnerability to resource shortages during an emergency. Revised goals were announced on May 2, 1980.

The stockpile inventory is compared with the 1980 goals in figure 1. Major restructuring of the stockpile inventory is necessary because most of the materials now in inventory were acquired during the 1950's. To fill the 1980 goals at September 1980 prices would require purchase of materials valued at approximately $12.6 billion. The stockpile inventory contains $8.1 billion of the needed materials for a total goal value of $20.7 billion. Since the stockpile inventory is valued at $14.9 billion, there is an excess not held for goals of $6.8 billion. Therefore, excess materials can be sold to cover the purchase cost of approximately half of the needed materials.

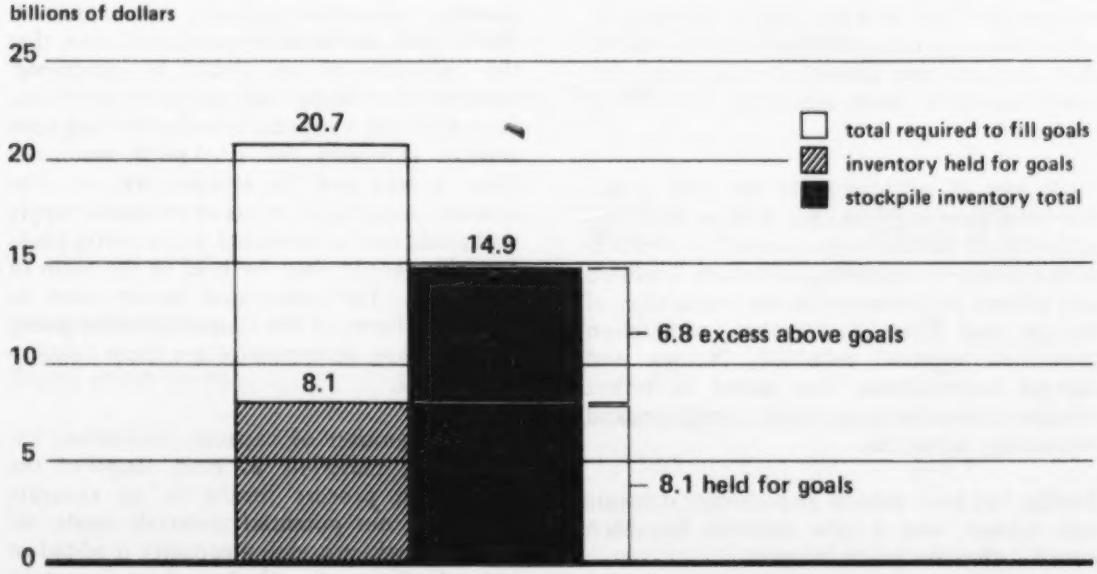


Figure 1

Restructuring of stockpile to meet 1980 goals.

As shown in figure 2, the 61 family groups and individual materials in the stockpile can be divided into two categories:

(1) 24 groups and individual materials with inventory equal to or greater than their goal; and

(2) 37 groups and individual materials with inventory less than their goal. Of these, 14 goals are over 50 percent filled.

The AMP process begins when FEMA gives a list of goals, deficits, excesses, and priorities to the General Services Administration. The materials proposed for purchase and/or sale are ranked according to defense need priority. The General Services Administration assesses the market for these materials and determines the quantities that could be bought and/or sold without market disruption. After these market constraints are added, the list is given to the AMP subcommittees for review.

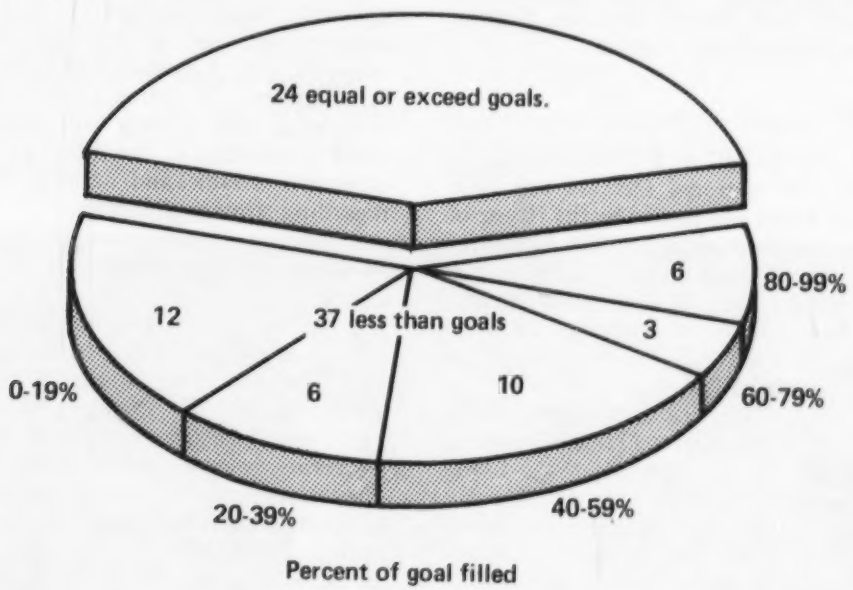


Figure 2

Status of the 61 family groups and individual materials in the stockpile inventory toward meeting the 1980 goals.

Annual Materials Plan

Presidential guidance includes a planning process for restructuring the stockpile through the Annual Materials Plan (AMP). The AMP is a list of stockpile materials proposed for acquisition and disposal developed each year through an interagency committee chaired by FEMA. The agencies represented on the Annual Materials Plan Steering Committee are the Departments of Defense, Commerce, the Interior, State, and Treasury, the Central Intelligence Agency, the General Services Administration, and the Office of Management and Budget.

The Strategic Implications Subcommittee, chaired by the Department of Defense, determines if the materials will be affected by changes in defense requirements. The International Economic and Political Impacts Subcommittee, chaired by the Department of State, determines the impact of AMP proposals on international producers, trade agreements, and foreign producer countries. The Market Impact Subcommittee, chaired by the Department of Commerce, examines the effect on commodity markets and develops the market impact statements. The Economic and Budgetary Impact Subcommittee, chaired by

FEMA, examines the revenue and cost projections of the AMP proposal.

After the recommendations from the subcommittees have been incorporated, the AMP is reviewed by all member agencies. Upon inclusion of approved revisions, the Director of FEMA submits the AMP to the National Security Council and simultaneously provides a copy to the Office of Management and Budget. Any further revisions are made jointly by the National Security Council, the Office of Management and Budget and the Federal Emergency Management Agency.

Legislation

The appropriation bill (H.R. 7583) containing moneys for the National Defense Stockpile Transaction Fund was passed by the House of Representatives on August 20, 1980. This fiscal year 1981 appropriation for $100 million would be used for stockpile acquisitions and attendent transportation expenses. The Annual Materials Plan list of materials and the quantities proposed for acquisition is on file with the Armed Services Committees of the Congress. These funds would remain available for five years as provided in the Stock Piling Act. At the close of the report period, the full Senate had not acted upon this appropriation, although the Senate Appropriations Committee had recommended acquisition funds of $50 million.

Revision of Data

Presidential planning guidance calls for a stockpile capable of supporting the United States military, industrial, and essential civilian needs for three years during a national emergency. It is assumed that prior industrial mobilization with attendent increased use of raw materials will occur, that austerity measures will be in effect, and that highest priority for acquiring needed material will be given to readiness for the first war year. These guidelines are incorporated into the econometric model used to estimate stockpile goals. Data used in this model covers many areas, such as consumption, production, capacity, imports and exports, and is revised on a continuing basis. This ensures that a current estimate will be available.

To assist FEMA in these revisions during the report period, the Department of Commerce provided 101 consumption analyses covering 1978 consumption; 1978 supply data for four materials; and 1978 domestic capacity data for seven materials. In addition to the actual data for 1978, the supply and domestic capacity studies provided projections for the years 1982 through 1984.

The Bureau of Mines in the Department of the Interior continued to issue monthly and quarterly "Mineral Industry Surveys" covering supplies and use of strategic and critical minerals. The Automated Minerals Information System is being developed. When completed, this system will make possible rapid assessment of the effect of changes in economic variables and/or policy assumptions regarding strategic minerals.

Research and Development

An alternative to stockpiling of strategic and critical materials is the development of domestic sources of supply. Additions to, or establishment of, domestic supply sources make possible a decrease in the stockpile goals. Therefore, research of a scientific, technologic and/or economic nature to develop domestic production or substitutes for strategic and critical materials is a continuing part of the stockpile program. Mandated under section 8 of the Stock Piling Act, government-sponsored research is primarily carried on by the Departments of the Interior, Commerce, and Agriculture.

The Departments of the Interior, Commerce, and Defense, and the Federal Emergency Management Agency continued joint sponsorship of National Academy of Sciences' studies on strategic materials. One study is evaluating the advantages of upgrading stockpiled materials to shorten emergency production lead times. Because versatility of application over as many uses as possible is an important feature for stockpiled materials, they are usually held in the form of raw ores. The study focuses upon balancing this need against the desirability of shorter production lead times resulting from holding upgraded forms. Other jointly sponsored studies are developing methods for assessing substitutability of

nonfuel materials and evaluating world managanese reserves.

Research in the Bureau of Mines includes development of new mining and processing technology, recycling methods, and improved materials for better performance. The Bureau is studying several methods of recovering or conserving chromium and is testing potential substitutes for chromium alloys. Chromium is a versatile strategic and critical material used in the metallurigal, chemical and refractory industries. It is used, for example, to impart corrosion resistance in iron and steel and nonferrous alloys, and to produce stainless steel. U.S. industry is 90 percent dependent upon foreign sources for this important metal—South Africa, Russia, Zimbabwe, and Turkey being major suppliers.

A survey conducted by the Bureau for FEMA shows that about 62,000 tons of chromium, primarily contained in obsolete stainless steel scrap, was available but not recycled in 1977. To help develop recovery techniques for scrap, a pilot plant has been designed to treat superalloy scrap containing critical materials including chromium. Other conservation approaches include surface chemistry research using ion implantation. This would produce a corrosion and wear-resistant layer having properties of a high-chromium alloy, while the bulk of the material would contain little chromium.

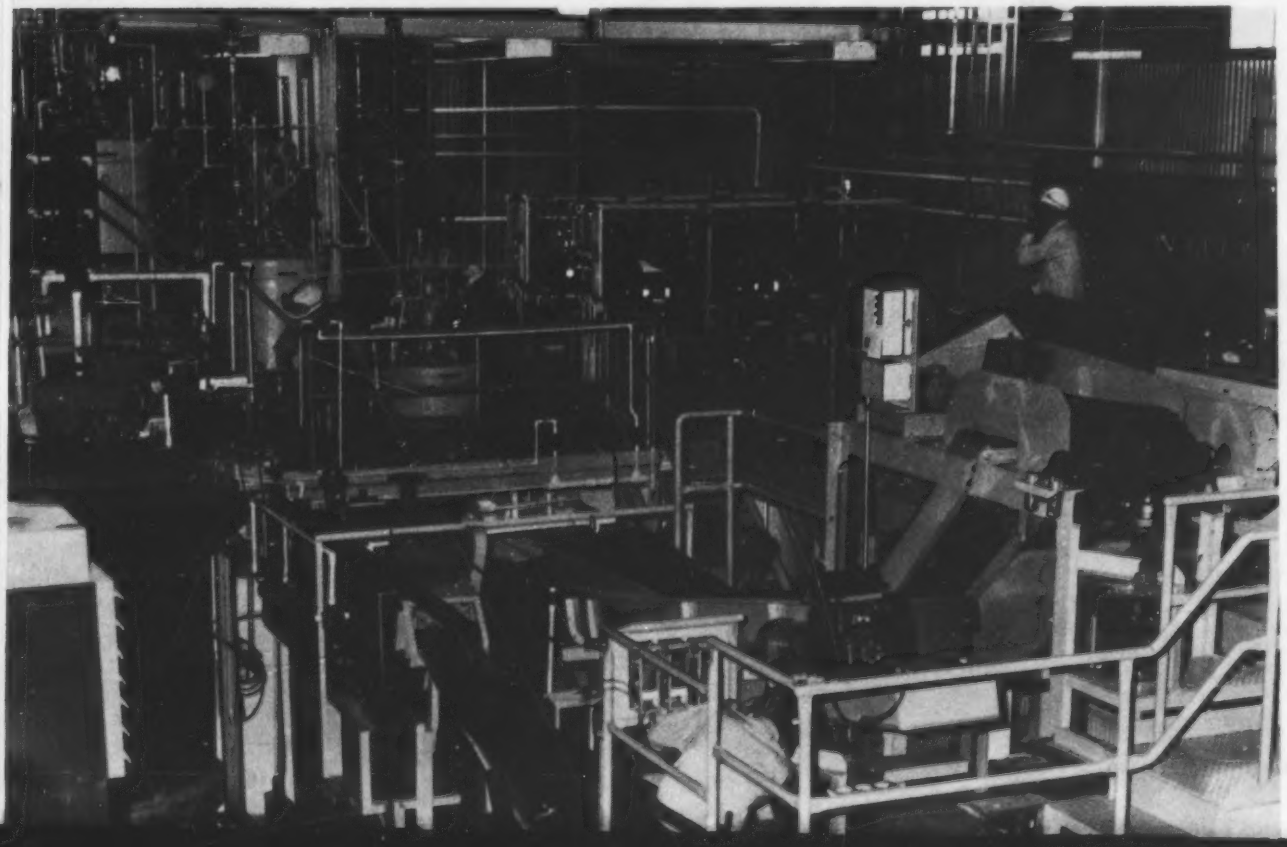
Apparatus used to prepare ion-implanted chrome surfaces on steel samples for evaluation of corrosion resistance.

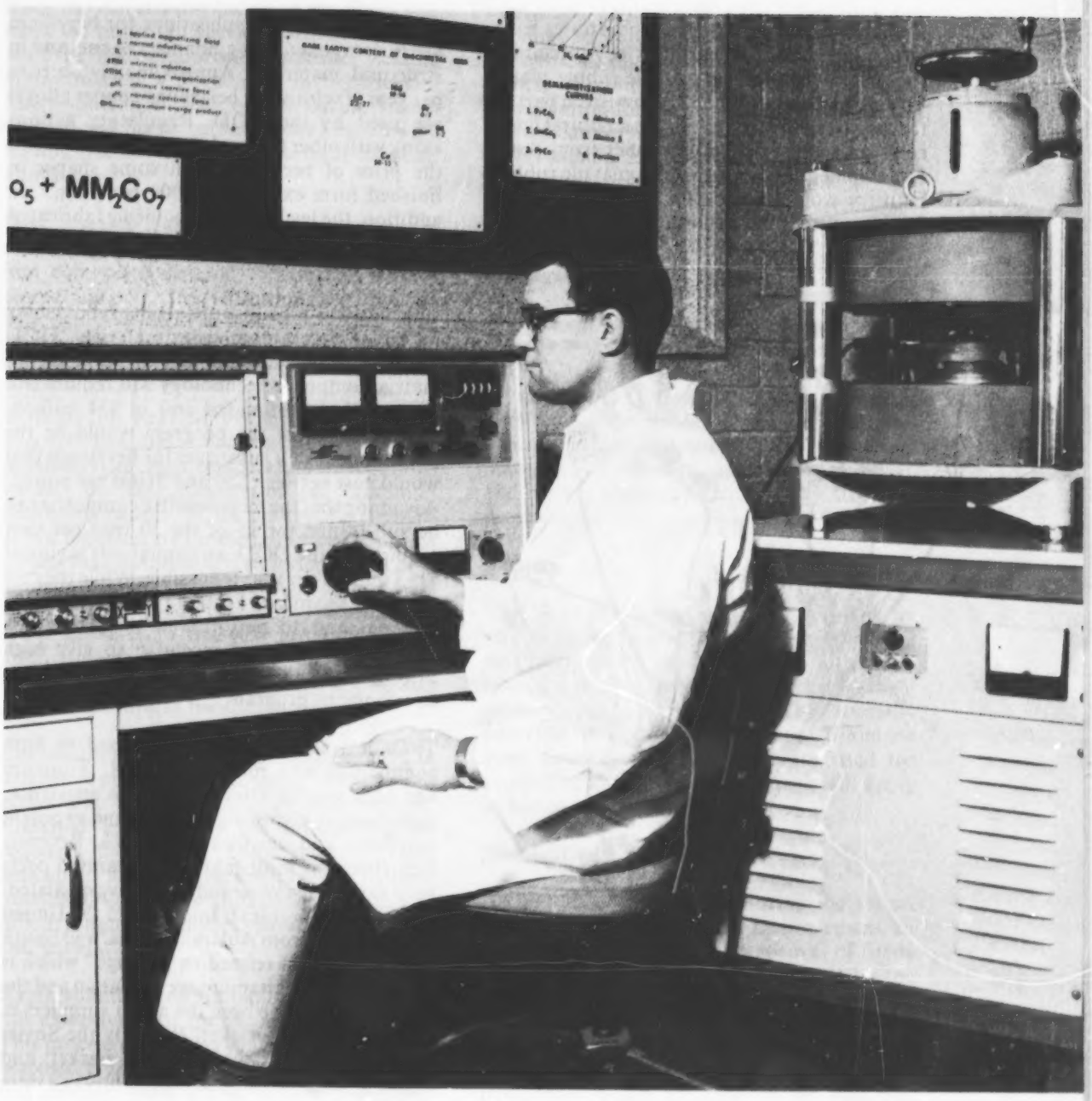
The U.S. Geological Survey conducts a broad-ranging nonfuel mineral exploration program to assess new domestic sources of mineral raw materials needed to satisfy future demands of U.S. industry. As part of this program, the "Stillwater Complex" in southwestern Montana is being studied. This complex has greater potential for the production of platinum and chromium than any other place in the conterminous United States. The project, which will require several years to complete, will assess the potential for development of chromium, copper, nickel, cobalt, and platinum-group elements in this area. A second objective of this investigation is to understand the origin, evolution, and controls on the distribution of mineral deposits in stratiform complexes.

Also under this Geological Survey nonfuel mineral research program is the study of the Appalachian region where mineral tourmaline in close association with sulfide deposits has been found. This type of deposit is an important source of copper, lead, and zinc. Tourmaline, a complex sodium-calcium-magnesium-boron-silicate, has been found with these ores at mines in Maine, Vermont, North Carolina, and Idaho. Similar occurrences of tourmaline are known at the Sullivan mine in British Columbia, and the Bleikvassli mine in Norway. Chemical analyses demonstrate that the tourmaline associated with these ore deposits is of unusual and distinctive compositions. This suggests that tourmaline represents an integral part of the ore-forming environment during the initial stages of mineralization. The presence of this distinctive tourmaline may therefore indicate the presence nearby of a concealed ore deposit.

A Bureau of Mines team including research and information and analysis personnel is assisting FEMA in formulating short and long-range research and development plans to improve our Nation's posture in abrasive, chemical, and refractory-grade bauxites. The Bureau updated a study entitled "Impact of the Current Guyana Refractory Bauxite Shortage."

Miniplant at Boulder City Engineering Laboratory, Nevada, tests plant to extract alumina from domestic resources.





Device used to measure magnetic properties of a rare-earth cobalt magnet.

Permanent magnets represent one of the largest uses of cobalt, accounting for about 20 percent of total U.S. consumption. Bureau of Mines scientists are evaluating rare-earth cobalt magnets in which 20 percent of the cobalt has been replaced by a mixture of copper, iron, and magnesium. Current studies indicate that the rare-earth magnets have intrinsic coercive forces equal to or greater than conventional nickel magnets.

Research grants at regional laboratories have been issued by the Department of Agriculture for development of the guayule rubber plant. This plant is native to the southwestern part of the United States and produces a natural latex equal in quality to hevea rubber from Asia. Development of a commercial guayule rubber industry would lessen our dependence upon foreign sources for natural rubber.

Guayule branch showing leaves and general appearance of plant that produces a natural latex (rubber).

As a hedge against possible shortages and cost escalations, the Department of Defense (DOD) is preparing a substitute materials research and development program. Possible substitute options open to the DOD have been identified for beryllium, titanium, cobalt and chromium.

The major defense applications for beryllium are in components in guidance systems and in structural materials. Approximately 30 tons per year (exclusive of beryllium-copper alloys) are used by the DOD. Regulatory actions along with other factors have steadily escalated the price of beryllium with some shapes in finished form exceeding $3000 per pound. In addition, the lead time for acquiring fabricated forms of beryllium has reached three years for some products.

The only feasible substitutes for beryllium may be metal-matrix composite materials. DOD estimates that development of this metal-matrix composite technology will require five years with an estimated cost of $34 million. The objective of the program would be the development of a substitute for beryllium that would cost between $50 and $1000 per pound. Assuming that the metal-matrix composite can be substituted for 25 of the 30 tons per year required by the DOD, an annual cost saving of $185 million per year is possible. While the cost saving is secondary to the availability of the material and to performance, it provides a significant additional incentive to give high priority to this metal-matrix composite development program.

Titanium metal structures are used in both commercial and military aircraft. Titanium has high specific strength, fatigue resistance, usefulness at high temperatures, and excellent corrosion and chemical resistance. Recently lead times for most fabricated titanium parts have exceeded a year, and costs have escalated. Titanium ore (rutile) is imported to the United States largely from Australia, India, and South Africa and then refined to "sponge" which is used to produce titanium metal. Japan and the Soviet Union have been the major suppliers in the international market. Recently the Soviet Union has withdrawn from the market, and Japan's available material is presently in a state of flux.

Some structural applications of titanium can substitute graphite-epoxy or graphite-polymide composites, but the most realistic group of substitute materials is from the metal-matrix composites family. Fiber-reinforced titanium composites may be substituted for the bulk metal. Savings in titanium metal result

from the direct substitution of the fibers and from the improved specific stiffness obtained with the fiber-reinforced composite, yielding approximately a 50 percent saving. Several fibers—silicon carbide coated boron, silicon carbide and boron carbide coated boron—are feasible reinforcements for several titanium alloys.

Basic research and development programs are evaluating a discontinuously reinforced titanium composite material. When high surface temperatures for short durations are found as in advanced tactical missile structures, a 90 to 100 percent savings of titanium can be achieved by substituting aluminum matrix composites with surface claddings of titanium or nickel foil. Feasibility of this clad composite concept has been demonstrated. Another possibility for high temperature applications would be the substitution of graphite-reinforced copper. While the specific strength at low temperature for the reinforced copper is far less than titanium, it is expected that at high temperatures, its specific strength and stiffness will exceed that of titanium. According to DOD estimates, a five-year program costing approximately $100 million would be required to explore and develop these options and provide substitutes for titanium.

Chromium and cobalt are critically needed in defense applications requiring metals and alloys able to withstand high temperatures. Principal uses include gas turbine engines required by fighter, bomber, cargo, and helicopter aircraft; intercontinental ballistic missiles, cruise and tactical missiles; tanks and infantry fighting vehicles; naval surface ships and submarines.

Rapid solidification technology may alleviate this extensive need for chromium and cobalt. This process can produce nickel alloy mixtures heretofore unknown in the form of an ultrafine powder. These alloys, essentially depleted of chromium and cobalt, are based primarily on other strengthening agents such as molybdenum and aluminum which are much more readily available. These new rapid solidifaction technology alloys seem to be equivalent to current alloys, although some limitations may exist. In addition, compounds such as previously developed metal-chromium-aluminum-yttria could provide the foundation for coatings to be applied by pack cementation methods. A small amount of chromium may have to be retained in the base alloy to provide a foundation for the chromium in the coating. Other coatings to be explored are based on the nickel-aluminides. Significant advances are being made in metal-matrix composite fabrication as an outgrowth of the DOD technology thrust in this area.

Management

The stockpile management functions in section 6 of the Act were delegated by Executive Order 12155 to the Administrator of General Services. The Federal Property Resources Service in the General Services Administration is assigned the storage, inspection, maintenance, security, acquisition, disposal, and market analyses activities of the stockpile program.

Barter

The Stockpile Act encourages use of barter arrangements to acquire strategic and critical materials where practical and in the best interests of the Government. Barter arrangements, where feasible, will be formally advertised or competitively negotiated, and the same findings and determinations used for acquisitions and disposals for cash will apply in barter transactions.

Acquisitions

No purchases were made during the report period. Plans were revised to implement an acquisition program upon approval of funds by the Congress. Guidelines required by the Stock Piling Act for all stockpile transactions include: (1) scheduling of disposals at a rate to maximize revenue to the Government while avoiding market disruption; (2) use of revenues from sales which are held in the National Defense Stockpile Transaction Fund to acquire materials; (3) use of advertising or competitive negotiation procedures in accordance with established Federal procurement practices; and (4) disposals for domestic consumption.

In addition, acquisitions will be scheduled according to the priorities established in the Annual Materials Plan with the most critical needs satisfied first. Comprehensive market plans for the disposal and acquisition quantities will be developed and adjusted periodically to reflect changing market conditions.

The Interagency Committee for Stockpile Purchase Specifications and Special Instructions is chaired by the Department of Commerce, and has representatives from the Departments of Defense, the Interior, and Agriculture, the General Services Administration and FEMA. The Committee is reviewing specifications and special instructions for aluminum oxide, abrasive, fused crude; beryl ore; beryllium copper master alloy; quinine sulfate; rutile; and silicon carbide, crude. Purchase specifications are also being developed for abrasive grade bauxite which was added to the list of strategic materials.

Sales

Authorized sales of excess materials during the period April 1—September 30, 1980, totaled approximately $18.9 million from the National Defense Stockpile, and $0.5 million from the Defense Production Act Inventory. Of the 21 materials authorized for sale, 8 were sold during the report period. As shown in table 1, the major sales were of tungsten ores and concentrates, diamond stones, and mica splittings. All of the listed materials were sold for industrial rather than government use.

Tin was offered for sale by invitation for bids as authorized by Public Law 96-175 at a rate of 500 metric tons every two weeks. These sales are restricted to domestic consumption. This rate of sale would be an annual amount of 10,000 metric tons. Bidding has been active but most bids have been rejected as too far under the current market price. The transfer of up to 5,000 long tons of tin to the International Tin Council Buffer Stock has not yet been made.

Sales of tungsten ores and concentrates are also made by invitation for bids. Two offerings were made—one for specification grade material and one for nonspecification grade. Three-fourths of the quantity sold is for domestic use and one-fourth for export. The House and Senate Armed Services Committees of the Congress were informed of this exception to the requirement in the Stock Piling Act which limits sales to domestic consumption.

During August and September, the Department of State consulted with foreign diplomatic missions on proposed stockpile disposals for the 1981 annual plan. Comments were invited from 37 countries. Based on the replies received and analyses of the pertinent markets, the Department recommended disposal levels to implement the Annual Materials Plan.

TABLE 1

DISPOSAL OF NATIONAL DEFENSE STOCKPILE MATERIALS
April—September 1980

Material	Unit	Quantity Sold	Value (Dollars)	Balance of Disposal Authorization Quantity
Asbestos, Amosite	ST	—	—	16,242
Asbestos, Crocidolite	ST	—	—	2,384
Celestite	SDT	—	—	13,415
Diamond, Industrial Stones	KT	784,190	11,670,655	2,215,810
Kyanite	SDT	—	—	1,187
Manganese Dioxide, Battery, Natural	SDT	7,397	591,760	109,473
Manganese Ore, Metallurgical Grade[1]	SDT	1,904	58,448	677,266
Mica, Muscovite Splittings	LB	47,887	79,839	511,335
Mica, Phlogopite Splittings	LB	199,244	244,669	1,058,031
Quartz Crystals	LB	—	—	1,823,036
Rare Earth Oxide	SDT	—	—	505
Talc, Block & Lump	ST	—	—	988
Talc, Ground	ST	—	—	1,089
Thorium Nitrate	LB	—	—	5,330,896
Tin	LT	5	84,436	34,995
Tungsten Ores & Concentrates[2]	LB W	678,600	5,507,807	35,966,037
Vegetable Tannin, Chestnut	LT	303	171,654	7,550
Vegetable Tannin, Quebracho	LT	897	508,973	95,657
Total from National Defense Stockpile			$18,859,793	

[1]Sold from the Defense Production Act Inventory.

[2]In addition, 49,969 LB W valued at $410,098 was sold from the Defense Production Act Inventory.

Transaction Fund

The General Services Administration manages the National Defense Stockpile Transaction Fund into which all moneys from the sale of stockpile materials are placed. An automated Management Information System monitors the status of all stockpile disposal and/or acquisition contracts. Actual moneys covered into the fund as well as outstanding billings to be collected, or in dispute are listed. This system keeps track of advance payments, interest, storage costs, and other collections. The Statistical Supplement to the Stockpile Report to the Congress, which is published by the General Services Administration, contains detailed information on the status of the fund.

STOCKPILE INVENTORY

Explanation of Table 2

The National Defense Stockpile total inventory as given in table 2 excludes quantities that were sold but not shipped from depots to the purchasers. In the Statistical Supplement (available from the General Services Administration) the inventory is listed as "Total Inventory in Storage" with a separate line for "Unshipped Sales."

The table 2 inventory quantities combine stockpile and nonstockpile grade materials, while separate lines can be found for each type in the Statistical Supplement. Some nonstockpile grade materials were acquired by transfer of government-owned surpluses after World War II or through Defense Production Act purchase programs. Other materials were of stockpile grade when acquired, but no longer qualify because of changes in industry practices. Nonstockpile grade material may vary only slightly from the stockpile grade and in some cases is temporarily credited toward goals.

For some materials where a goal deficit occurs, the excess of another form of that material is held to offset the shortage as indicated in the footnotes at the end of table 2. The term "offset" means allocating one form of a material for an equivalent amount of another form.

Materials are grouped by "families," and a summary line for each basic family group is included. The materials have been grouped in each family according to their status as raw material, semifinished products or finished products that contain the same common ingredient. The values shown in the summary line for each family group are expressed in the basic unit common to all members of the group. In all but three cases, this basic unit is the metal equivalent for each form. There is a different conversion factor for each form because each requires different technology and incurs different conversion losses. The factors used for calculating these equivalent amounts and the calculation procedure are in appendix 2.

Market values are prices at which comparable materials are being traded, or in the absence of trading, values are estimates. They are not necessarily the amount that would be realized if the material were sold.

Shellac has been removed as no longer strategic and critical leaving 61 family groups and individual materials. Bauxite, abrasive grade, was added to the aluminum oxide, abrasive grain group which is numbered as a group. Therefore, this addition does not increase the total number.

TABLE 2

NATIONAL DEFENSE STOCKPILE INVENTORY OF STRATEGIC AND CRITICAL MATERIALS

September 30, 1980

Commodity	Unit	1980 Goal	Inventory	Value of Inventory (Millions $)	Quantity After Crediting Offset Excess	Quantity After Crediting Offset Deficit
1. Aluminum Metal Group	**ST Al Metal**	**7,150,000**	**3,444,064**	**551.1**		**3,705,936**
Alumina	ST	0	0	—		—
Aluminum	ST	700,000	1,733	2.4		698,267
Bauxite, Metal Grade, Jamaica Type	LDT	21,000,000	8,858,881	334.1		12,141,119
Bauxite, Metal Grade, Surinam Type	LDT	6,100,000	5,299,596	214.6		800,404
2. Aluminum Oxide, Abrasive Grain Group	**ST Ab Grain**	**638,000**	**259,124**	**124.0**		**378,876**
Aluminum Oxide, Abrasive Grain	ST	0	50,904	59.0	a/	
Aluminum Oxide, Fused, Crude	ST	0	249,867	65.0	a/	
Bauxite, Abrasive Grade	LCT	1,000,000	0	—		a/
3. Antimony	**ST**	**36,000**	**40,730**	**163.7**	**4,730**	
4. Asbestos, Amosite	**ST**	**17,000**	**42,534**	**21.9**	**25,534**	
5. Asbestos, Chrysotile	**ST**	**3,000**	**9,958**	**8.9**	**6,958**	
6. Bauxite, Refractory	**LCT**	**1,400,000**	**174,599**	**34.0**		**1,225,401**
7. Beryllium Metal Group	**ST Be Metal**	**1,220**	**1,061**	**150.1**		**159**
Beryl Ore (11% BeO)	ST	18,000	17,987	18.8		13
Beryllium Copper Master Alloy	ST	7,900	7,387	67.2		513
Beryllium Metal	ST	400	229	64.1		171
8. Bismuth	**LB**	**2,200,000**	**2,081,298**	**5.2**		**118,702**
9. Cadmium	**LB**	**11,700,000**	**6,328,729**	**15.8**		**5,371,271**
10. Castor Oil (Sebacic Acid)	**LB**	**22,000,000**	**5,009,697**	**8.9**		**9,475,757**[1]
11. Chromium, Chemical and Metallurgical Group	**ST Cr Metal**	**1,353,000**	**1,173,230**	**1,033.8**		**179,770**
Chromite, Chemical Grade Ore	SDT	675,000	242,414	14.3		b

TABLE 2

NATIONAL DEFENSE STOCKPILE INVENTORY OF STRATEGIC AND CRITICAL MATERIALS (Continued)

September 30, 1980

Commodity	Unit	1980 Goal	Inventory	Value of Inventory (Millions $)	Quantity After Crediting Offset Excess	Deficit
Chromite, Metallurgical Grade Ore	SDT	3,200,000	2,488,043	258.9		b/
Chromium, Ferro, High Carbon	ST	185,000	402,696	269.5	b/	
Chromium, Ferro, Low Carbon	ST	75,000	318,892	418.1	b/	
Chromium, Ferro, Silicon	ST	90,000	58,355	43.6		b/
Chromium, Metal	ST	20,000	3,763	29.4		b/
12. Chromite, Refractory Grade Ore	**SDT**	**850,000**	**391,414**	**36.9**		**458,586**
13. Cobalt	**LB Co**	**85,400,000**	**40,802,393**	**1,020.1**		**44,597,607**
14. Columbium Group	**LB Cb Metal**	**4,850,000**	**2,510,528**	**37.7**		**2,339,472**
Columbium Carbide Powder	LB Cb	100,000	21,372	.6		78,628
Columbium Concentrates	LB Cb	5,600,000	1,780,463	29.3		c/
Columbium, Ferro	LB Cb	0	930,911	6.0	c/	
Columbium, Metal	LB Cb	0	44,851	1.8	c/	
15. Copper	**ST**	**1,000,000**	**29,048**	**65.1**		**970,952**
16. Cordage Fibers, Abaca	**LB**	**155,000,000**	**0**	**—**		**155,000,000**
17. Cordage Fibers, Sisal	**LB**	**60,000,000**	**0**	**—**		**60,000,000**
18. Diamond, Industrial Group	**KT**	**29,700,000**	**42,929,316**	**416.1**	**13,229,316**	
Diamond Dies, Small	PC	60,000	25,473	1.1		34,527
Diamond, Industrial, Crushing Bort	KT	22,000,000	23,692,782	66.1	1,692,782	
Diamond, Industrial, Stones	KT	7,700,000	19,223,798	348.9	11,523,798	
19. Feathers and Down	**LB**	**1,500,000**	**0**	**—**		**1,500,000**
20. Fluorspar, Acid Grade	**SDT**	**1,400,000**	**895,983**	**125.4**		**504,017**
21. Fluorspar, Metallurgical Grade	**SDT**	**1,700,000**	**411,738**	**40.1**		**1,288,262**
22. Graphite, Natural, Ceylon, Amorphous Lump	**ST**	**6,300**	**5,498**	**5.2**		**802**

TABLE 2

NATIONAL DEFENSE STOCKPILE INVENTORY OF STRATEGIC AND CRITICAL MATERIALS (Continued)

September 30, 1980

Commodity	Unit	1980 Goal	Inventory	Value of Inventory (Millions $)	Quantity After Crediting Offset Excess	Deficit
23. Graphite, Natural, Malagasy, Crystalline	**ST**	**20,000**	**17,911**	**11.9**		**2,089**
24. Graphite, Natural, Other than Ceylon & Malagasy	**ST**	**2,800**	**2,802**	**.5**	**2**	
25. Iodine	**LB**	**5,800,000**	**8,013,074**	**47.3**	**2,213,074**	
26. Jewel Bearings	**PC**	**120,000,000**	**68,731,890**	**61.2**		**51,268,110**
27. Lead	**ST**	**1,100,000**	**601,036**	**504.9**		**498,964**
28. Manganese, Dioxide, Battery Grade Group	**SDT**	**87,000**	**250,643**	**23.3**	**163,643**	
Manganese, Battery Grade, Natural Ore	SDT	62,000	247,632	20.3	d/	
Manganese, Battery Grade, Synthetic Dioxide	SDT	25,000	3,011	3.0		d/
29. Manganese, Chemical & Metallurgical Group	**ST Mn Metal**	**1,500,000**	**1,586,581**	**529.8**	**86,581**	
Manganese Ore, Chemical Grade	SDT	170,000	221,044	18.1	51,044	
Manganese Ore, Metallurgical Grade	SDT	2,700,000	3,378,713	186.2		e/
Manganese, Ferro, High Carbon	ST	439,000	599,978	273.2	e/	
Manganese, Ferro, Low Carbon	ST	0	0	—	—	
Manganese, Ferro Medium Carbon	ST	0	28,920	22.0	e/	
Manganese, Ferro, Silicon	ST	0	23,574	11.6	e/	
Manganese Metal, Electrolytic	ST	0	14,172	18.7	e/	
30. Mercury	**FL**	**10,500**	**191,391**	**78.0**	**180,891**	
31. Mica Muscovite Block, Stained and Better	**LB**	**6,200,000**	**5,212,444**	**27.8**		**987,556**

TABLE 2

NATIONAL DEFENSE STOCKPILE INVENTORY OF STRATEGIC AND CRITICAL MATERIALS (Continued)

September 30, 1980

Commodity	Unit	1980 Goal	Inventory	Value of Inventory (Millions $)	Quantity After Crediting Offset Excess	Deficit
32. Mica Muscovite Film, First and Second Qualities	LB	90,000	1,274,495	14.9	1,184,495	
33. Mica Muscovite Splittings	LB	12,630,000	19,546,395	39.1	6,916,395	
34. Mica Phlogopite Block	LB	210,000	130,745	.1		79,255
35. Mica Phlogopite Splittings	LB	930,000	2,019,537	2.0	1,089,537	
36. Molybdenum Group	LB Mo	0	0	—	—	
Molybdenum Disulphide	LB Mo	0	0	—	—	
Molybdenum, Ferro	LB Mo	0	0	—	—	
37. Nickel	ST Ni+Co	200,000	0	—		200,000
38. Opium Group	AMA LB	130,000	71,303	29.6		58,697
Opium, Gum	AMA LB	0	31,795	6.7	f	
Opium, Salt	AMA LB	130,000	39,508	22.9		f
39. Platinum Group Metals, Iridium	Tr Oz	98,000	16,991	10.2		81,009
40. Platinum Group Metals, Palladium	Tr Oz	3,000,000	1,255,003	282.4		1,744,997
41. Platinum Group Metals, Platinum	Tr Oz	1,310,000	452,640	215.0		857,360
42. Pyrethrum	LB	500,000	0	—		500,000
43. Quartz Crystals	LB	600,000	2,423,036	14.5	1,823,036	
44. Quinidine	Av Oz	10,100,000	1,800,462	7.8		8,299,538
45. Quinine	Av Oz	4,500,000	3,246,164	10.9		1,253,836
46. Rubber	LT	850,000	119,208	209.6		730,792
47. Rutile	SDT	106,000	39,186	12.7		66,814

TABLE 2

NATIONAL DEFENSE STOCKPILE INVENTORY OF STRATEGIC AND CRITICAL MATERIALS (Continued)

September 30, 1980

Commodity	Unit	1980 Goal	Inventory	Value of Inventory (Millions $)	Quantity After Crediting Offset Excess	Deficit
48. Saphire and Ruby	**KT**	**0**	**16,305,502**	**.2**	**16,305,502**	
49. Silicon Carbide, Crude	**ST**	**29,000**	**80,548**	**36.2**	**51,548**	
50. Silver, Fine	**Tr Oz**	**0**	**139,500,000**	**3,113.6**	**139,500,000**	
51. Talc, Steatite Block and Lump	**ST**	**28**	**1,092**	**.4**	**1,064**	
52. Tantalum Group	**LB Ta Metal**	**7,160,000**	**2,391,940**	**397.2**		**4,768,060**
Tantalum, Carbide Powder	LB Ta	0	28,688	5.0	g	
Tantalum Metal	LB Ta	0	201,133	40.2	g	
Tantalum Minerals	LB Ta	8,400,000	2,551,302	352.0		g
53. Thorium Nitrate	**LB**	**600,000**	**7,146,312**	**19.7**	**6,546,312**	
54. Tin	**LT**	**42,000**	**200,472**	**3,585.1**	**158,472**	
55. Titanium Sponge	**ST**	**195,000**	**32,331**	**431.8**		**162,669**
56. Tungsten Group	**LB W Metal**	**50,666,000**	**81,883,096**	**876.1**	**31,217,096**	
Tungsten Carbide Powder	LB W	2,000,000	2,032,942	29.2	h/	
Tungsten, Ferro	LB W	0	2,025,361	24.7	h/	
Tungsten, Metal Powder	LB W	1,600,000	1,898,911	26.4	h/	
Tungsten Ores & Concentrates	LB W	55,450,000	89,219,603	795.8	h/	
57. Vanadium Group	**ST V Metal**	**8,700**	**541**	**5.9**		**8,159**
Vanadium, Ferro	ST V	1,000	0	–		1,000
Vanadium Pentoxide	ST V	7,700	541	5.9		7,159
58. Vegetable Tannin Extract, Chestnut	**LT**	**5,000**	**16,894**	**9.4**	**11,894**	
59. Vegetable Tannin Extract, Quebracho	**LT**	**28,000**	**144,828**	**81.9**	**116,828**	
60. Vegetable Tannin Extract, Wattle	**LT**	**15,000**	**16,398**	**9.2**	**1,398**	
61. Zinc	**ST**	**1,425,000**	**375,970**	**282.9**		**1,049,030**

[Sebacic Acid inventory is credited toward Castor Oil goal at a rate of 2.5 to 1.

OFFSETS

a. **Aluminum Oxide, Fused Crude:** hold 249,864 ST of fused crude as offset against 208,220 ST of aluminum oxide, abrasive grain.

b. **Chromium Group, Chemical and Metallurgical Grades:** metallurgical grade ore goal is 3,200,000 SDT of specification grade; inventory 1,956,824 SDT; shortfall 1,243,176 SDT.

(1) Hold 217,695 ST of Fe Cr high carbon against shortfall of 544,238 SDT of specification grade ore.
(2) Hold 243,892 ST of Fe Cr low carbon against 609,730 SDT of specification grade ore.
(3) Hold 89,208 SDT of non-specification grade metallurgical ore against the balance of the 89,208 SDT specification grade ore shortfall.
(4) Hold 47,466 SDT of non-specification grade metallurgical ore against a shortfall of 31,644 ST of Fe Cr Si.
(5) Hold 56,830 SDT of non-specification grade metallurgical ore against a shortfall of 16,237 ST of chromium metal.
(6) Hold 337,715 SDT of non-specification grade metallurgical ore against 337,715 SDT of chemical grade ore shortfall.

c. **Columbium Group:**

(1) Hold 930,911 pounds Cb as Fe Cb against 1,095,189 pounds Cb as concentrates.
(2) Hold 44,851 lb Cb as Cb metal against 52,766 lb Cb as concentrates.

d. **Manganese, Dioxide, Battery Grade Group:**

Hold 21,989 SDT of managanese, battery grade, natural ore against a shortfall of 21,989 SDT of manganese, battery grade, synthetic dioxide.

e. **Manganese Group, Chemical and Metallurgical Grades:** metallurgical grade ore goal is 2,700,000 SDT; inventory 2,409,377 SDT; shortfall 290,623 SDT of stockpile grade ore.

(1) Hold 14,172 ST of Mn metal against 35,430 SDT of metallurgical ore.
(2) Hold 23,574 ST of Fe Mn Si against 42,433 SDT of metallurgical ore.
(3) Hold 28,921 ST of Fe Mn medium carbon against 57,842 SDT of metallurgical ore.
(4) Hold 77,460 ST of Fe Mn high carbon against 154,920 SDT of metallurgical ore.
(5) Hold remaining 83,518 ST of Fe Mn high carbon against reduction of ore value in desired inventory mix.

f. **Opium:** Hold 31,795 AMA lb of opium gum against 31,795 AMA lb of opium salt goal.

g. **Tantalum Group:**

(1) Hold 201,133 lb Ta as Ta metal against 237,337 lb Ta as concentrates.
(2) Hold 28,688 lb Ta as Ta C against 33,852 lb Ta as concentrates.

h. **Tungsten Group:**

(1) WC powder goal is 2,000,000 lb W; stockpile grade inventory 1,921,167 lb W; shortfall 78,833 lb W. Hold 111,775 lb W as non-specification grade WC to offset 78,243 lb W as WC specification grade (assume 70% recovery of usable W).

(2) W metal powder goal is 1,600,000 lb W; inventory stockpile grade 1,566,964 lb W; shortfall 33,036 lb W. Non-stockpile grade W metal powder inventory is 331,947 lb W. Assume 70% recovery as usable material, then 331,947 x .70=232,363 lb W. Hold 47, 194 lb W as non-specification grade powder to offset shortfall of 33,036 stockpile grade W powder.

(3) Hold balance of non-stockpile grade W powder 232,363 - 33,036 = 199,327 lb W as powder against 234,209 lbs W as concentrate.

(4) Hold 840,752 lbs W as Fe W stockpile grade against 987,884 lb W as concentrate. Hold 1,184,609 lb W nonstockpile grade Fe W at 70 percent recoverable against 974,341 lb W concentrate.

Abbreviations

AMA Lb	- Anhydrous Morphine Alkaloid (Pounds)	LCT	- Long Calcined Ton
AvOz	- Avoirdupois Ounce	LDT	- Long Dry Ton
FL	- Flask (76-Pound)	LT	- Long Ton
KT	- Carat	PC	- Piece
LB	- Pound	SDT	- Short Dry Ton
LB Cb	- Pounds of Contained Columbium	ST	- Short Ton
LB Co	- Pounds of Contained Cobalt	ST Ni+Co	- Short Tons of Contained Nickel plus Cobalt
LB Mo	- Pounds of Contained Molybdenum	ST V	- Short Tons of Contained Vanadium
LB Ta	- Pounds of Contained Tantalum	TrOz	- Troy Ounces
LB W	- Pounds of Contained Tungsten		

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APPENDIX I

STRATEGIC AND CRITICAL MATERIALS STOCK PILING ACT

(50 U.S.C. 98 *et. seq.)*

SEC. 1. This Act may be cited as the 'Strategic and Critical Materials Stock Piling Act'.

FINDINGS AND PURPOSE

SEC. 2.(a) The Congress finds that the natural resources of the United States in certain strategic and critical materials are deficient or insufficiently developed to supply the military, industrial, and essential civilian needs of the United States for national defense.

(b) It is the purpose of this Act to provide for the acquisition and retention of stocks of certain strategic and critical materials and to encourage the conservation and development of sources of such materials within the United States and thereby to decrease and to preclude, when possible, a dangerous and costly dependence by the United States upon foreign sources for supplies of such materials in times of national emergency.

MATERIALS TO BE ACQUIRED: PRESIDENTIAL AUTHORITY AND GUIDELINES

SEC. 3. (a) The President shall determine from time to time (1) which materials are strategic and critical materials for the purposes of this Act, and (2) the quality and quantity of each such material to be acquired for the purposes of this Act and the form in which each such material shall be acquired and stored. Such materials when acquired, together with the other materials described in section 4 of this Act, shall constitute and be collectively known as the National Defense Stockpile (hereinafter in this Act referred to as the 'stockpile').

(b) The President shall make the determinations required to be made under subsection (a) on the basis of the following principles:

(1) The purpose of the stockpile is to serve the interest of national defense only and is not to be used for economic or budgetary purposes.

(2) The quantities of the materials stockpiled should be sufficient to sustain the United States for a period of not less than three years in the event of a national emergency.

(c) The quantity of any material to be stockpiled under this Act, as determined under subsection (a), may not be revised unless the Committees on Armed Services of the Senate and House of Representatives are notified in writing of the proposed revision and the reasons for such revision at least thirty days before the effective date of such revision.

MATERIALS CONSTITUTING THE NATIONAL DEFENSE STOCKPILE

SEC. 4.(a) The stockpile consists of the following materials:

(1) Materials acquired under this Act and contained in the national stockpile on the day before the date of the enactment of the Strategic and Critical Materials Stock Piling Revision Act of 1979.

(2) Materials acquired under this Act on or after the date of the enactment of the Strategic and Critical Materials Stock Piling Revision Act of 1979.

(3) Materials in the supplemental stockpile established by section 104(b) of the Agricultural Trade Development and Assistance Act of 1954 (as in effect from September 21, 1959, through December 31, 1966) on the day before the date of the enactment of the Strategic and Critical Materials Stock Piling Revision Act of 1979.

(4) Materials acquired by the United States under the provisions of section 303 of the Defense Production Act of 1950 (50 U.S.C. App. 2093) and transferred to the stockpile by the President pursuant to subsection (f) of such section.

(5) Materials transferred to the United States under section 663 of the Foreign Assistance Act of 1961 (22 U.S.C. 2423) that have been determined to be strategic and critical materials for the

purposes of this Act and that are allocated by the President under subsection (b) of such section for stockpiling in the stockpile.

(6) Materials acquired by the Commodity Credit Corporation and transferred to the stockpile under section 4(h) of the Commodity Credit Corporation Charter Act (15 U.S.C. 714b(h)).

(7) Materials acquired by the Commodity Credit Corporation under paragraph (2) of section 103(a) of the Act entitled 'An Act to provide for greater stability in agriculture; to augment the marketing and disposal of agricultural products; and for other purposes', approved August 28, 1954 (7 U.S.C. 1743(a)), and transferred to the stockpile under the third sentence of such section.

(8) Materials transferred to the stockpile by the President under paragraph (4) of section 103(a) of such Act of August 28, 1954.

(9) Materials transferred to the stockpile under subsection (b).

(b) Notwithstanding any other provision of law, any material that (1) is under the control of any department or agency of the United States, (2) is determined by the head of such department or agency to be excess to its needs and responsibilities, and (3) is required for the stockpile shall be transferred to the stockpile. Any such transfer shall be made without reimbursement to such department or agency, but all costs required to effect such transfer shall be paid or reimbursed from funds appropriated to carry out this Act.

AUTHORITY FOR STOCKPILE OPERATIONS

SEC. 5. (a) Except for acquisitions made under the authority of paragraph (3) or (4) of section 6(a), no funds may be obligated or appropriated for acquisition of any material under this Act unless funds for such acquisition have been authorized by law. Funds appropriated for such acquisition (and for transportation related to such acquisition) shall remain available for a period of five fiscal years, if so provided in appropriation Acts.

(b) Except for disposals made under the authority of paragraph (4) or (5) of section 6(a) or under section 7(a), no disposal may be made from the stockpile unless such disposal, including the quantity of the material to be disposed of, has been specifically authorized by law.

(c) There is authorized to be appropriated such sums as may be necessary to provide for the transportation, processing, refining, storage, security, maintenance, rotation, and disposal of materials contained in or acquired for the stockpile. Funds appropriated for such purposes shall remain available to carry out the purposes for which appropriated for a period of two fiscal years, if so provided in appropriation Acts.

STOCKPILE MANAGEMENT

SEC. 6. (a) The President shall—

(1) acquire the materials determined under section 3(a) to be strategic and critical materials;

(2) provide for the proper storage, security, and maintenance of materials in the stockpile;

(3) provide for the refining or processing of any material in the stockpile when necessary to convert such material into the form most suitable for storage and subsequent disposition;

(4) provide for the rotation of any material in the stockpile when necessary to prevent deterioration of such material by replacement of such material with an equivalent quantity of substantially the same material;

(5) subject to the notification required by subsection (d)(2), provide for the timely disposal of materials in the stockpile that (A) are excess to stockpile requirements, and (B) may cause a loss to the Government if allowed to deteriorate; and

(6) dispose of materials in the stockpile the disposal of which is specifically authorized by law.

(b) Except as provided in subsections (c) and (d), acquisition of strategic and critical materials under this Act shall be made in accordance with established Federal procurement practices, and, except as provided in subsections (c) and (d) and in section 7(a), disposal of materials from the stockpile shall be made by formal advertising or competitive negotiation procedures. To the maximum extent feasible—

(1) competitive procedures shall be used in the acquisition and disposal of such materials;

(2) efforts shall be made in the acquisition and disposal of such materials to avoid undue disruption of the usual markets of producers, processors, and consumers of such materials and to protect the United States against avoidable loss; and

(3) disposal of such materials shall be made for domestic consumption.

(c)(1) The President shall encourage the use of barter in the acquisition of strategic and critical materials for, and the disposal of materials from, the stockpile when acquisition or disposal by barter is authorized by law and is practical and in the best interest of the United States.

(2) Materials in the stockpile, the disposition of which is authorized by law, shall be available for transfer at fair market value as payment for expenses (including transportation and other incidental expenses) of acquisition of materials, or of refining, processing, or rotating materials, under this Act.

(3) To the extent otherwise authorized by law, property owned by the United States may be bartered for materials needed for the stockpile.

(d)(1) The President may waive the applicability of any provision of the first sentence of subsection (b) to any acquisition of material for, or disposal of material from, the stockpile. Whenever the President waives any such provision with respect to any such acquisition or disposal, or whenever the President determines that the application of paragraph (1), (2), or (3) of such subsection to a particular acquisition or disposal is not feasible, the President shall notify the Committees on Armed Services of the Senate and House of Representatives in writing of the proposed acquisition or disposal at least thirty days before any obligation of the United States is incurred in connection with such acquisition or disposal and shall include in such notification the reasons for not complying with any provision of such subsection.

(2) Materials in the stockpile may be disposed of under subsection (a)(5) only if the Committees on Armed Services of the Senate and House of Representatives are notified in writing of the proposed disposal at least thirty days before any obligation of the United States is incurred in connection with such disposal.

(e) The President may acquire leasehold interests in property, for periods not in excess of twenty years, for storage, security, and maintenance of materials in the stockpile.

SPECIAL DISPOSAL AUTHORITY OF THE PRESIDENT

SEC. 7. (a) Materials in the stockpile may be released for use, sale, or other disposition—

(1) on the order of the President, at any time the President determines the release of such materials is required for purposes of the national defense; and

(2) in time of war declared by the Congress or during a national emergency, on the order of any officer or employee of the United States designated by the President to have authority to issue disposal orders under this subsection, if such officer or employee determines that the release of such materials is required for purposes of the national defense.

(b) Any order issued under subsection (a) shall be promptly reported by the President, or by the officer or employee issuing such order, in writing, to the Committees on Armed Services of the Senate and House of Representatives.

MATERIALS DEVELOPMENT AND RESEARCH

SEC. 8. (a)(1) The President shall make scientific, technologic, and economic investigations concerning the development, mining, preparation, treatment, and utilization of ores and other mineral substances that (A) are found in the United States, or in its territories or possessions, (B) are essential to the national defense, industrial, and essential civilian needs of the United States, and (C) are found in known domestic sources in inadequate quantities or grades.

(2) Such investigations shall be carried out in order to—

(A) determine and develop new domestic sources of supply of such ores and mineral substances;

(B) devise new methods for the treatment and utilization of lower grade reserves of such ores and mineral substances; and

(C) develop substitutes for such essential ores and mineral products.

(3) Investigations under paragraph (1) may be carried ou on public lands and, with the consent of the owner, on privately owned lands for the purpose of exploring and determining the extent and quality of deposits of such minerals, the most suitable methods of mining and beneficiating such minerals, and the cost at which the minerals or metals may be produced.

(b) The President shall make scientific, technologic, and economic investigations of the feasibility of developing domestic sources of supplies of any agricultural material or for using agricultural commodities for the manufacture of any material determined pursuant to section 3(a) of this Act to be a strategic and critical material or substitutes therefor.

NATIONAL DEFENSE STOCKPILE TRANSACTION FUND

SEC. 9. (a) There is established in the Treasury of the United States a separate fund to be known as the National Defense Stockpile Transaction Fund (hereinafter in this section referred to as the 'fund').

(b)(1) All moneys received from the sale of materials in the stockpile under paragraphs (5) and (6) of section 6(a) shall be covered into the fund. Such moneys shall remain in the fund until appropriated or until the end of the third fiscal year following the fiscal year in which they are received. Any such moneys remaining in the fund after the end of such third fiscal year that have not been appropriated shall be transferred to miscellaneous receipts of the Treasury. Any of such moneys that are appropriated shall be disbursed from the fund in the order in which they were covered into the fund.

(2) Moneys covered into the fund under paragraph (1) shall be available, when appropriated therefor, only for the acquisition of strategic and critical materials under section 6(a)(1) of this Act (and for transportation related to such acquisition).

(3) If so provided in appropriation Acts, moneys in the fund, when appropriated, shall remain available for a period of five fiscal years.

(c) All moneys received from the sale of materials being rotated under the provisions of section 6(a)(4) or disposed of under section 7(a) shall be covered into the fund and shall be available only for the acquisition of replacement materials.

ADVISORY COMMITTEES

SEC. 10. (a) The President may appoint advisory committees composed of individuals with expertise relating to materials in the stockpile or with expertise in stockpile management to advise the President with respect to the acquisition, transportation, processing, refining, storage, security, maintenance, rotation, and disposal of such materials under this Act.

(b) Each member of an advisory committee established under subsection (a) while serving on the business of the advisory committee away from such member's home or regular place of business shall be allowed travel expenses, including per diem in lieu of substance, as authorized by section 5703 of title 5, United States Code, for persons intermittently employed in the Government service.

REPORTS TO CONGRESS

SEC. 11. The President shall submit to the Congress every six months a written report detailing operations under this Act. Each such report shall include—

(1) information with respect to foreign and domestic purchases of materials during the preceding six-month period;

(2) information with respect to the acquisition and disposal of materials under this Act by barter, as provided for in section 6(c) of this Act, during such period;

(3) a statement and explanation of the financial status of the National Defense Stockpile Transaction Fund and the anticipated appropriations to be made from the fund during the next fiscal year; and

(4) such other pertinent information on the administration of this Act as will enable the Congress to evaluate the effectiveness of the program provided for under this Act and to determine the need for additional legislation.

DEFINITIONS

SEC. 12. For the purposes of this Act:

(1) The term 'strategic and critical materials' means materials that (A) would be needed to supply the military, industrial, and essential civilian needs of the United States during a national emergency, and (B) are not found or produced in the United States in sufficient quantities to meet such need.

(2) The term 'national emergency' means a general declaration of emergency with respect to the national defense made by the President or by the Congress.

SEC. 13. Notwithstanding any other provision of law, on and after January 1, 1972, the President may not prohibit or regulate the importation into the United States of any material determined to be strategic and critical pursuant to the provisions of this Act, if such material is the product of any foreign country or area not listed as a Communist-dominated country or area in general headnote 3(d) of the Tariff Schedules of the United States (19 U.S.C. 1202), for so long as the importation into the United States of material of that kind which is the product of such Communist-dominated countries or areas is not prohibited by any provision of law.

NOTE:

The Strategic and Critical Materials Stock Piling Act was amended July 30, 1979 (93 Stat. 319 (50 U.S.C. 98 *et seq.*)) by replacing sections 1 through 9, redesignating section 10 as section 13, and repealing section 11. By Executive Order 12155 of September 10, 1979, the functions vested in the President by sections 3 and 11 are transferred to the Director of the Federal Emergency Management Agency. The functions in sections 6 and 10 are transferred to the Administrator of General Services; those in section 8 are transferred to the Secretary of the Interior and the Secretary of Agriculture.

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APPENDIX 2

CALCULATION PROCEDURE FOR FAMILY GROUPINGS OF MATERIALS

The following example is designed to help the reader perform and understand the conversions and calculations used in preparing summary lines for basic family groupings. The purpose in using basic units for each of the families or groups of materials is to place the content of the primary material into a common denominator for easier comparison.

In time of emergency, there would be a need for a mix of various forms of each metal element. The stockpile goal for a metal is a mix of products at various stages of upgrading. The goal is calculated by examining expected wartime requirements, availability, and domestic capacity to produce each of the upgraded forms.

There is a different factor for converting each of the forms into a common denominator, usually the basic metal equivalent. The conversion factors are different because process conversion losses vary. The calculations and conversions used for beryllium metal group are shown as an example. The figures used do not reflect the current inventory quantities.

The beryllium metal group has a surplus of beryl ore (11%BeO) and shortfalls of beryllium copper master alloy (BCMA) and beryllium metal. Beryl ore is a raw material used in producing the other two products. The surplus of beryl ore is used to offset the shortfall of the upgraded forms, but in different proportions for each product because of the product composition and the accompanying processing loss.

Commodity	Unit	Goal	Total Inventory	Excess	Deficit
Beryllium Metal	**ST Be Metal**	**1,563**	**1,061**		**502**
Beryl Ore (11% BeO)	ST	0	17,986	0	0
Beryllium Copper Master Alloy	ST	16,710	7,387	0	0
Beryllium Metal	ST	895	229	0	502

PROCEDURE

1. Note that the available surplus of beryl ore is 17,986 ST.

2. Calculate the shortfall of BCMA.

16,710 ST Goal minus 7,387 ST inventory equals 9,323 ST shortfall.

3. Calculate the quantity of beryl ore required to offset 9,323 ST of BCMA.

9,323 ST BCMA times 1.3 equals 12,120 ST beryl ore.

4. Calculate the basic unit equivalent of the 9,323 ST of BCMA.

9,323 ST BCMA times 0.04 equals 373 ST beryllium metal.

5. Subtract the quantity of ore calculated to offset the shortfall of BCMA (3 above) from the total quantity of ore available (1 above).

17,986 ST ore minus 12,120 ST ore equals 5,866 ST of ore remaining.

6. The remaining quantity of surplus ore not used to cover the BCMA shortfall can now be used to offset part of the shortfall of beryllium metal. Convert the remaining ore to beryllium metal.

5,866 ST ore times 0.02801 equals 164 ST beryllium metal.

7. The total surplus beryl ore has been converted to the two upgraded forms, BCMA and beryllium metal, to cover the shortfall of these forms. The balance of excess ore is now zero.

12,120 ST ore converted to 9,323 ST BCMA

5,866 ST ore converted to 164 ST beryllium metal

Total 17,986 ST ore converted to BCMA and beryllium metal.

In converting the ore to beryllium metal, only one conversion was required. To convert the BCMA to the basic unit, i.e., beryllium metal, an additional conversion is needed. BCMA contains a nominal 4 percent beryllium metal. To convert the BCMA to beryllium metal, simply multiply 9,323 BCMA ST by .04 which equals 373 ST of beryllium metal.

The conversion to basic units is now complete.

12,120 ST ore to BCMA to beryllium metal equals 373 ST.

5,866 ST ore to beryllium metal equals 164 ST.

Total of 17,986 ST ore equals 537 ST beryllium metal.

EXAMPLE - BERYLLIUM METAL (ST)

	Beryl Ore (11% BeO)	Equivalent Basic Units
Excess to Goal	17,986	
Converted to Offset BCMA Shortfall (9,323 X 1.3)	-12,120	373
Balance	5,866	
Converted to Offset Beryllium Metal Shortfall (5,866 X 0.02801)	-5,866	164
Balance of Excess	0	
Total of Basic Units Offset		537

The balance of the family totals is shown in the table. Each of the forms of beryllium material has been converted to the basic beryllium metal units for easy subtraction and addition. Surplus material is shown as positive, shortfalls are shown as negative. The final balance for the family is 1,061 ST in inventory, 1,563 ST needed for the goal, leaving a shortfall of 502 ST beryllium metal.

Balance of Family Totals in Basic Units

	Inventory	Goal	Excess (+) Deficit (-)
Beryl Ore (11% BeO)	537	0	537
BCMA	295	668	-373
Beryllium Metal	229	895	-666
Total	1,061	1,563	-502

Factors Used for Converting Materials Into Family Groups

Materials	Unit	Multiple Factor	Basic Family Unit
Alumina	ST	0.518	Metal Equivalent, Aluminum
Aluminum Oxide, Fused, Crude	ST	0.85	Aluminum Oxide, Abrasive Grain
Bauxite, Abrasive Grade[1]	LCT	0.641	Aluminum Oxide, Abrasive Grain S.T.
Bauxite, Metal Grade, Jamaica Type	ST	0.231	Metal Equivalent, Aluminum
Bauxite, Metal Grade, Surinam Type	ST	0.264	Metal Equivalent, Aluminum
Beryl Ore (11% BeO)	ST	0.028	Metal Equivalent, Beryllium
Beryllium Copper Master Alloy (4% Be)	ST	0.04	Metal Equivalent, Beryllium
Chromite, Chemical Grade Ore	ST	0.286	Metal Equivalent, Chromium
Chromite, Metallurgical Grade Ore	ST	0.286	Metal Equivalent, Chromium
Chromium, Ferro, High Carbon	ST	0.714	Metal Equivalent, Chromium
Chromium, Ferro, Low Carbon	ST	0.714	Metal Equivalent, Chromium
Chromium, Ferro, Silicon	ST	0.429	Metal Equivalent, Chromium
Columbium, Concentrates	LB	0.850	Metal Equivalent, Columbium
Diamond Dies, Small	PC	0.50	Carat
Manganese, Dioxide, Battery Grade	SDT	1.000	Manganese, Dioxide, Battery Grade, Synthetic
Manganese, Chemical Grade	ST	0.400	Metal Equivalent, Manganese
Manganese, Metallurgical Grade	ST	0.400	Metal Equivalent, Manganese
Manganese, Ferro, High Carbon	ST	0.800	Metal Equivalent, Manganese
Manganese, Ferro, Medium Carbon	ST	0.800	Metal Equivalent, Manganese
Manganese, Ferro, Silicon	ST	0.720	Metal Equivalent, Manganese
Opium Gum	AMA LB	1.000	Opium Salts
Tantalum Minerals	LB	0.85	Metal Equivalent, Tantalum
Tungsten Ores and Concentrates	LB	0.851	Metal Equivalent, Tungsten

[1]New conversion factor furnished by Bureau of Mines, Department of the Interior.

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